SECTION 13036

CLEANROOM WALL SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions apply to this Section.

1.2 SUMMARY:

A. This Section provides the requirements necessary to fabricate, furnish, erect a complete framed (studded) and conductive cleanroom wall assembly. Work shall include but is not limited to the following:
   1. Metal framing system, including all items such as clips, anchors, screws, attachments, and supports, etc., which will provide a completely demountable, nonprogressive, load bearing assembly for cleanroom walls.
   2. Pre-finished Cleanroom wall panel material attached to the above framing system.
   3. Provide all reinforcing, bracing, blocking, trim finishing strips, and non-outgassing close cell type gasketing necessary to maintain the structural and air sealing requirements of the assembly.
   4. Window panels with glazing.
   5. Grilles without dampers

1.3 REFERENCES/PROJEJCT REQUIREMENTS

A. Requirements of the following Project Specification Sections apply to this section:
   1. Division 0 – Contract Instructions
   2. Section 01110 – Cleanroom Construction Protocol
   3. Section 01111 – Cleanroom Construction and Cleaning Procedures
   4. Section 01112 – Cleanroom Certification and Acceptance
   5. Section 08300 – Automatic Cleanroom Doors
   6. Section 08311 – Manual Cleanroom Doors
   7. Section 13019 – Ceiling Grid Support System
   8. Section 13020 – Cleanroom Gasketed Ceiling System
   9. Section 13070 – Cleanroom Pass-Through

B. Additional Project Requirements:
   1. ASTM A568 – Specification for Steel, Sheet, Carbon, and High-Strength, Low-Alloy, Hot-Rolled and Cold-Rolled.
   2. ASTM A6 – Specification for General Requirements for Rolled Structural Steel Bars, Plates, Shapes, and Sheet Piling
   3. ASTM A635 – Standard Specification for Steel, Sheet and Strip, Heavy-Thickness Coils, Carbon, Hot-Rolled
   4. ASTM A700 – Practices for Packaging, Marking, and Loading Methods for Steel Products for Domestic Shipment
   5. ASTM A751 – Test Methods, Practices, and Terminology for Chemical Analysis of Steel Products

1.4 SUBMITTALS

A. Submit the following in accordance with the Conditions of the Contract and Division 1:

1. Manufacturer's Data: Submit manufacturer's literature, specifications, and installation instructions for each cleanroom wall system proposed for use, including certification and other data as may be required to show compliance with the Specifications.
2. Calculations: Submit design calculation for clean wall framing system to the Engineer for review prior to fabrication and erection.
3. Samples:
   a. Submit samples of wall systems component with specified finish, gasketing and connectors, or other components as necessary to illustrate a completed wall assembly.
   b. Submit 12-inch-square samples for each finish and color required. Submit sample finishes on aluminum having the specified alloy, temper, finish coating treatment, and thickness of metal required for the work. Samples will be reviewed for color and finish only. Compliance with all other requirements is the exclusive responsibility of the Contractor.
4. Shop Drawings: Submit complete shop drawings, schedule and erection diagrams. Shop drawings shall give all pertinent information of construction method proposed, including connections, all required dimensions for the proper fitting for the connection with other work and materials, and all special conditions as may be required to complete installation. Show full elevations of all walls, indicating component dimensions, wall penetrations, joint locations, and intended closures at joints.
5. Installer's Manufacture Certification: copy of certificate of license issued to system installer by manufacturer of cleanroom wall system company.
6. Maintenance Manual: Submit copies of an assembled and bound maintenance manual describing the materials, devices and procedures to be followed in cleaning and maintaining the cleanroom wall system. Include manufacturer's literature describing the metal alloys, finishes, sealants, gaskets and all other major components, as well as methods of disassembly and re-assembly.

1.5 QUALITY ASSURANCE

A. Cleanroom wall system key personnel shall be trained and approved by the separate system component manufacturers and shall have experience in the installation of cleanroom wall systems of not less than 5 years.

B. Installation company shall have been in business a minimum of 5 years, specializing in cleanroom wall systems work for class 10 and cleaner and it must have:
   1. Successfully completed a minimum of 3 similar projects during this time.
   2. A list shall be provided showing projects similar in size, complexity, and cleanliness classification to this project that the firm has completed. This list shall include the project name, description of mechanical system, range of services provided, and the name and phone number of the Architect or Design Consultant and the Owner who were responsible for final acceptance of the cleanroom.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Wall system panels shall be delivered with an approved protective coating and packaged to prevent dust from contaminating surfaces while in transit and during construction.

B. Deliver materials in their manufacturer's original unopened packages.

C. Unpacking shall be done outside the cleanroom area.

D. Exercise extreme care in handling partition components to prevent damage.

E. Store materials within the building in space designated by the CONSTRUCTION MANAGER

F. Store materials in such manner as to prevent damage or intrusion of foreign matter. Conspicuously mark “REJECTED” on materials which have been damaged and remove from the jobsite.

1.7 WARRANTY

A. Cleanroom Wall Components: Submit copies of written warranty agreement to repair or replace any and all wall components which fail due to factory workmanship, manufacturing defects or apparent deterioration excluding normal wear and tear.

B. Warranty shall be for a period of 5 years and shall begin following Date of Substantial Completion of project.

C. Prior to starting work, submit sample copy of warranty to be provided. Upon completion and acceptance of the work required by this Section, submit an executed copy of the warranty.

D. Complete installation shall be warranted jointly and severally on a single document by the materials manufacturer and installer against defects of materials and workmanship as defined in the warranty.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Channel Systems

B. Plascore

C. LSI Wall Systems

2.2 COMPONENTS

A. Framed Cleanroom Wall System: panels of specified thickness, to be a modular wall system with aluminum honeycomb core and aluminum face finished on both sides. Wall hardware includes all deflection headtrack, floortrack, corner details, and appurtenances. Single wall segments shall originate at finish floor and terminate at ceiling (refer to drawings).
   1. Headtrack: Painted extruded aluminum, predrilled for connection to the ceiling grid at 12 inch on center maximum. Headtrack to provide vibration isolation between cleanroom wall panel and ceiling system, allow 1/2 inch minimum vertical movement.
   2. Aluminum Honeycomb Wall Panel: Nominal 48 inches wide by scheduled ceiling height by ¼ inch or 2 inch thick, aluminum skins over aluminum honeycomb core continuously bonded.
      a. Static charge: <150 volts at all surfaces
      b. Leak tightness: No measurable air leaks across wall joints at: 250 Pascal (1 inches H_2O) differential static pressure.
      c. Conductivity: <10^6 ohms
   3. Glazing:
      a. Tempered glass, conductive coating
      b. Conductivity: 10^6 to 10^8 ohms grounded with wall system
      c. Color:
         1) Clear Transparent

2) Orange Transparent

d. Transmittance: no measurable transmittance <500 nm wave length at locations requiring Orange Transparent glazing

e. Thickness: ¼"

4. Floortrack: Painted extruded aluminum, predrilled for connection to structural floor at 18 inch on center minimum.
5. Panel Post: Mounting block hardware on bottom of post to be t-bolted, into the floortrack, on both sides at every connection. Plastic cover continuous over fasteners on the battens.
6. Louvers: ½" thick, clear anodized aluminum egg-crate grating
7. Miscellaneous: Corners, door frames, bulkhead frames, glazing frames shall be painted aluminum sizes compatible with the panel thickness.

B. Wall System Doors and Frames: Furnish and install cleanroom doors in the specified wall system in accordance with Sections 08300 and 08311.

2.3 FINISHES

A. Honeycomb Wall Panel, head track, floor track, corner posts and other exposed metal components: Roll coat, static-dissipative epoxy paint finish. Color as selected by Owner from standard color line.

B. Glazing and Joint Battens. Color to match wall panel.

PART 3 - EXECUTION

3.1 INSTALLERS

A. The nature of the completed facility demands special attention to maintaining an overall cleanliness in the project area. Methods of construction, which minimize the generation of contaminants, are essential if major cleanup problems are to be avoided. The installation of the cleanroom wall system involves the major exposure of surface area within the cleanroom and, therefore, represents a potential for surface contamination unless careful attention is paid to the manner in which the erection and placement is handled.

B. Vendor must provide one full-time quality assurance supervisor who shall direct installation of all wall components to ensure quality of final installation. All installation methods shall be in accordance with the latest recommendations of the component manufacturer and in conformance with this Specification and submittal drawings.

3.2 EXAMINATION

A. Examine substrates and adjoining construction and conditions under which work is to be installed. Do not proceed with the work until unsatisfactory conditions have been corrected.

3.3 ERECTION

A. Verify dimensions of supporting structure by field measurements so that cleanroom wall will be accurately designed, fabricated, and fitted to the structure.

B. Coordinate cleanroom wall work with the work of related sections and provide items to be placed during the installation of other work at the proper time to avoid delays in the work. Place such items, including inserts and anchors, accurately in relation to the final location of the cleanroom wall system components using locking-type devices at all connections.

C. Erect all component parts of the cleanroom wall in accordance with the manufacturer's written instructions and recommendations.

D. Framing and finish members shall be accurately aligned in accordance with the drawings and securely anchored. Position framing vertically, spaced as required. Locate framing adjacent to door frames, openings, door pockets, partition intersections, and corners. Fasten wall panels securely in place, flush with adjacent panels.

E. Partition components shall assemble into a rigid structure with tight straight-line joints. Completed installation shall be free of exposed bolts, nuts, rivets, and fasteners within the cleanroom area and shall interface with all mechanical and electrical work in a clearly preplanned and craftsman-like installation.

F. Erection Tolerances:
1. Erect all component parts within the following tolerances - Variations Form Plumb or Angle Shown: 1/8-inch maximum variation in height or 10-foot run. Non-cumulative.
2. Offsets in End-to-End or Edge-to-Edge Alignment of Consecutive Members: 1/16-inch maximum offset in any alignment.

G. Cutting and Trimming of Component Parts:
1. Cut and trim component parts of the cleanroom wall during erection only with the approval of the manufacturer or fabricator and in accordance with his recommendations. Restore finish completely to protect material and remove all evidence of cutting and trimming. All cutting and trimming to be done outside the cleanroom area.

H. Do not erect members which are observed to be warped, bowed, deformed, or otherwise damaged or defaced to such extent as to impair strength or appearance. Remove and replace members damaged in the process of erection.

I. Set units level, plumb, and true to line with uniform joints. Support and secure in place by bolting to clip angles and similar supports anchored to supporting structure.

J. Paint concealed contact surfaces of dissimilar materials with a heavy coating of isolation paint or provide other separations as per manufacturer's recommendations.

3.4 CLEANING

A. Provide cleaning methods required for each component part as recommended by the respective manufacturers.

B. Cleaning methods shall be carefully selected, applied, and maintained so that finishes will not become uneven or otherwise impaired.

C. The nature of the project requires special attention to minimizing potential contamination of the fully developed cleanroom environment. All construction dust and contaminants left on surfaces or in recesses that will be exposed to cleanroom air will have the effect of unduly loading up the filter system. Daily cleanup and vacuuming of the work area is essential to an ongoing control of contaminants.

3.5 PROTECTION

A. Protect the cleanroom wall system throughout the construction period in a clean and properly protected condition so that it will be without any indication of use or damage at the time of substantial completion.

B. Protect the work during shipment, storage, erection, and construction so as to avoid development of non-uniformity of appearance or other deleterious effects in the work.

C. Remove protection when requested by Architect or Construction Manager for inspection of finishes and replace any damaged material.

D. Remove protection when no longer required.

END OF SECTION 13036